VFTA010R077NA

Datasheet

7.7mΩ, 100V, N-Channel Power MOSFET VFTA010R077NA

General Description

$V_{(BR)DSS}$	$R_{DS(ON)\_max}$	I_D
100V	5.2mΩ@10V	87A

Symbol

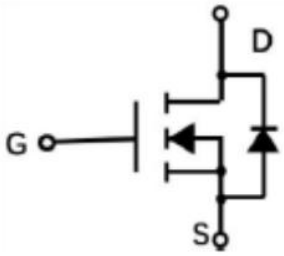
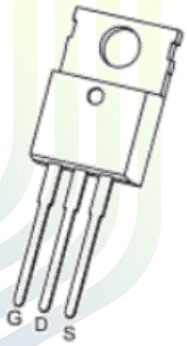


Figure 1 Symbol of VFTA010R077NA

Features

- Split Gate Trench Technology
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested

Package Type



TO-220-3L

Figure 2 Package Type of VFTA010R077NA

Application

- Industrial Power Supply
- Load Switch

Ordering Information

Product Name	Package
VFTA010R077NA	TO-220-3L

Absolute Maximum Ratings (T_A= 25 ºC, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current[Note1]	T_C= 25 ºC	I_D	87	A
Pulsed Drain Current [Note2]		I_{DM}	350	
Avalanche Current[Note3]		I_{AS}	36	
Single Pulsed Avalanche Energy[Note3]		E_{AS}	324	mJ
Total Power Dissipation[Note5]	T_C= 25 ºC	P_D	138	W
Junction Temperature		T_J	150	ºC
Storage Temperature		T_{STG}	-55 to 150	ºC

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Ambient [Note6]	$R_{\theta JA}$		60		ºC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$		0.9		ºC/W

Electrical Characteristics (T_J= 25 ºC, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D= 250uA	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage[Note4]	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	2	3	V
Static Drain-Source On-Resistance[Note4]	$R_{DS(ON)}$	V_{GS}=10V, I_D= 20A		6.7	7.7	mΩ
Forward Transconductance[Note4]	g_{FS}	V_{DS}=10V, I_D= 10A		29		S
Dynamic Characteristics						
Input Capacitance	C_{ISS}	V_{DS}=50V		2915		pF
Output Capacitance	C_{OSS}	V_{GS}=0V		370		pF
Reverse Transfer Capacitance	C_{RSS}	f=1MHz		16		pF
Total Gate Charge	Q_g	V_{DS}=50V		55		nC
Gate-Source Charge	Q_{gs}	V_{GS}=10V		18		nC
Gate-Drain Charge	Q_{gd}	I_D= 45A		14		nC
Gate Resistance	Rg	f = 1MHz, Open drain		1.2		Ω
Switching Parameters						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}= 50V		15		ns
Turn-on Rise Time	t_r	V_{GS}= 10V		10		ns
Turn-off Delay Time	$t_{d(off)}$	R_L=1.2Ω		32		ns
Turn-off Fall Time	t_f	R_G=3Ω		10		ns
Diode Characteristics						
Diode Forward Voltage [Note4]	V_{SD}	V_{GS}=0V, I_S= 10A			1.2	V

Notes :

1.The maximum current rating is limited by package.And device mounted on a large heatsink.

2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

3.E_{AS} condition: V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G=25Ω Starting T_J = 25°C.

4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

5.The power dissipation P_D is limited by $T_{J(MAX)}$ = 150°C.And device mounted on a large heatsink

6.Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Performance Characteristics

Figure 3: Transfer Characteristics

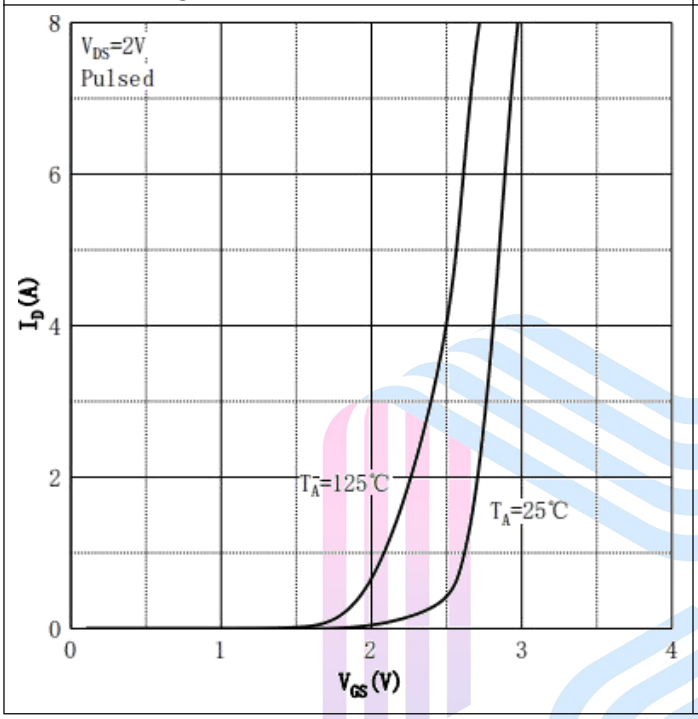


Figure 4: Output Characteristics

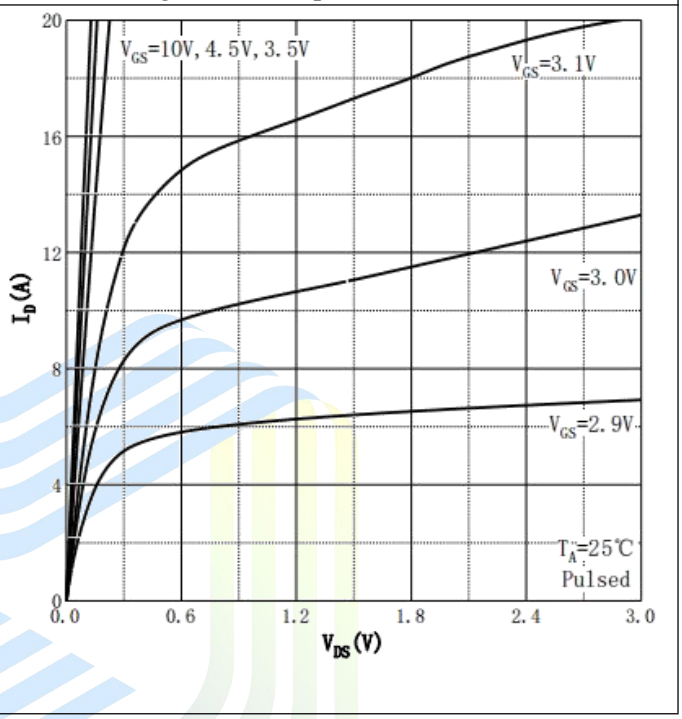


Figure 5: On-Resistance vs. Drain Current

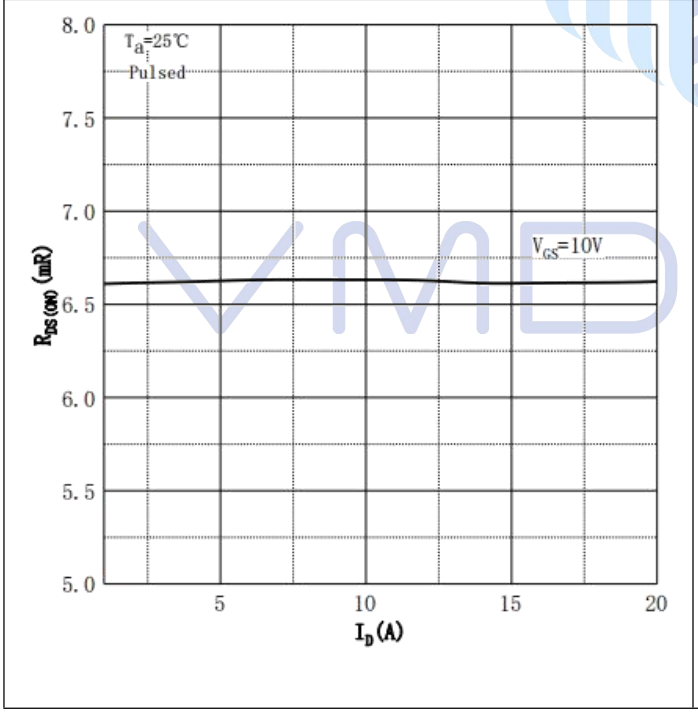


Figure 6: On-Resistance vs. Gate Voltage

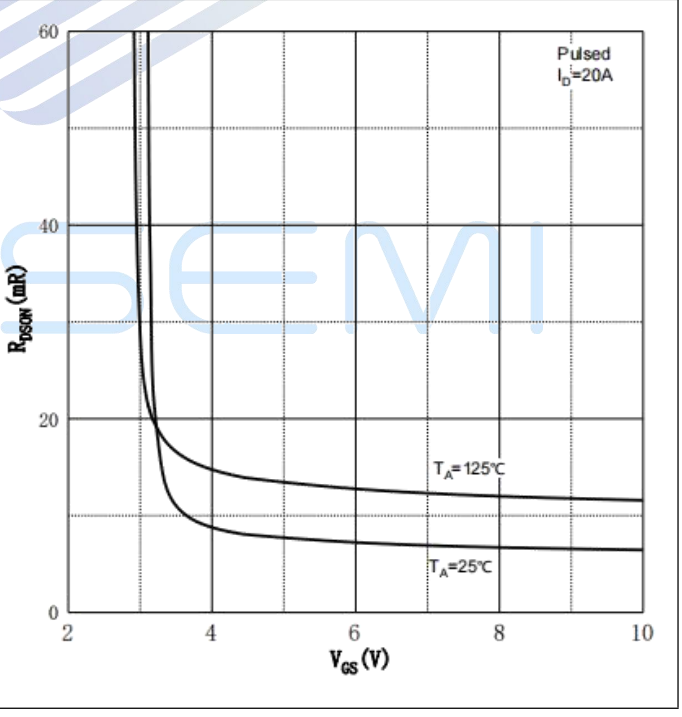


Figure 7: Body Diode Characteristics

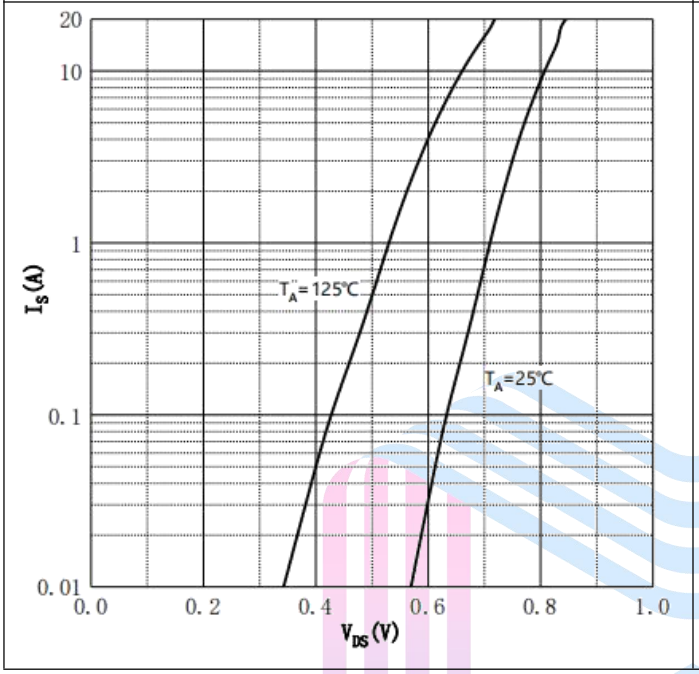


Figure 8: Threshold Voltage

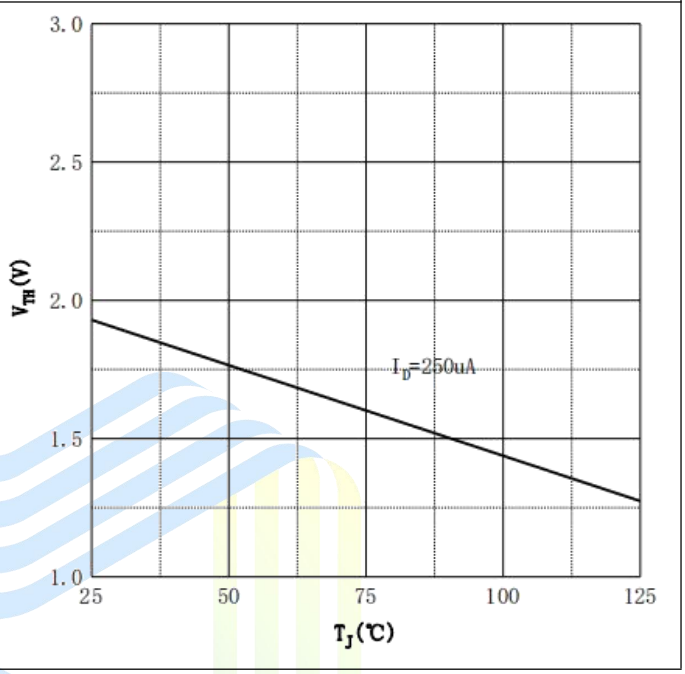


Figure 9: Typical Capacitance

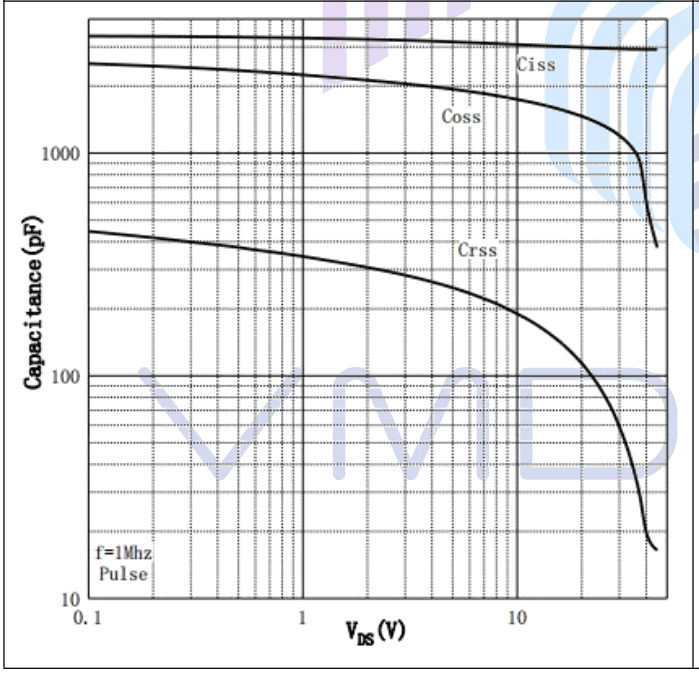


Figure 10: Safe Operation Area

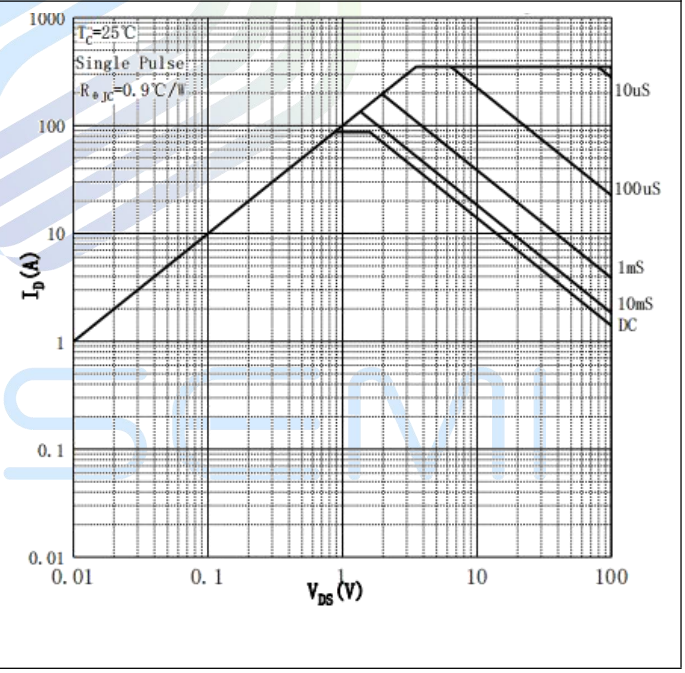
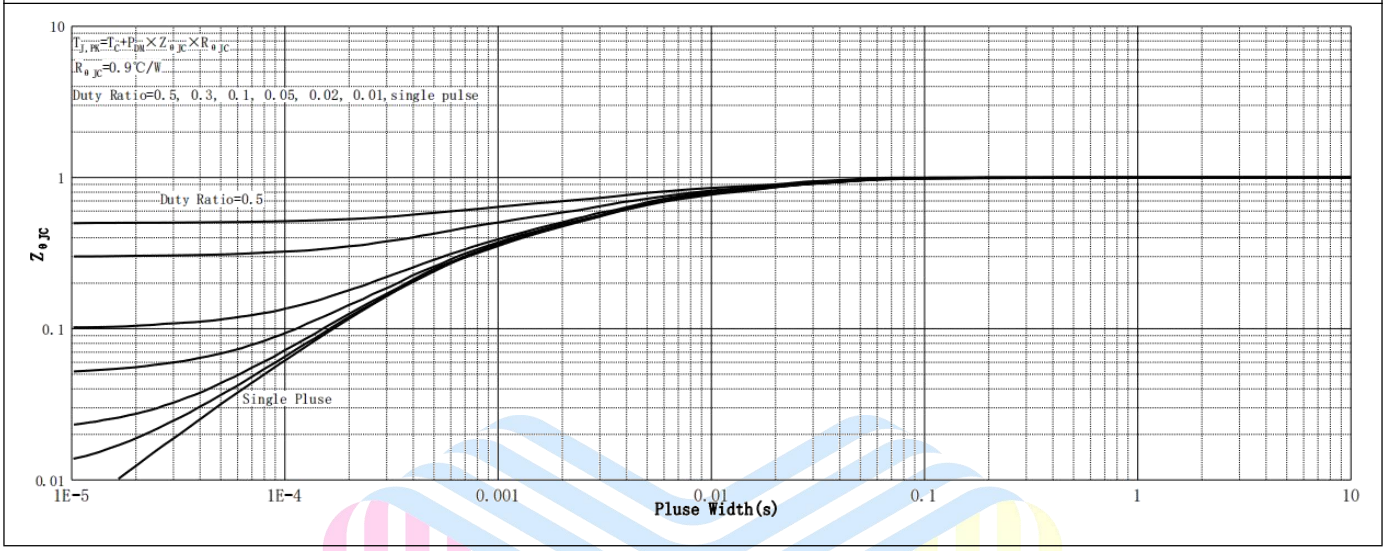
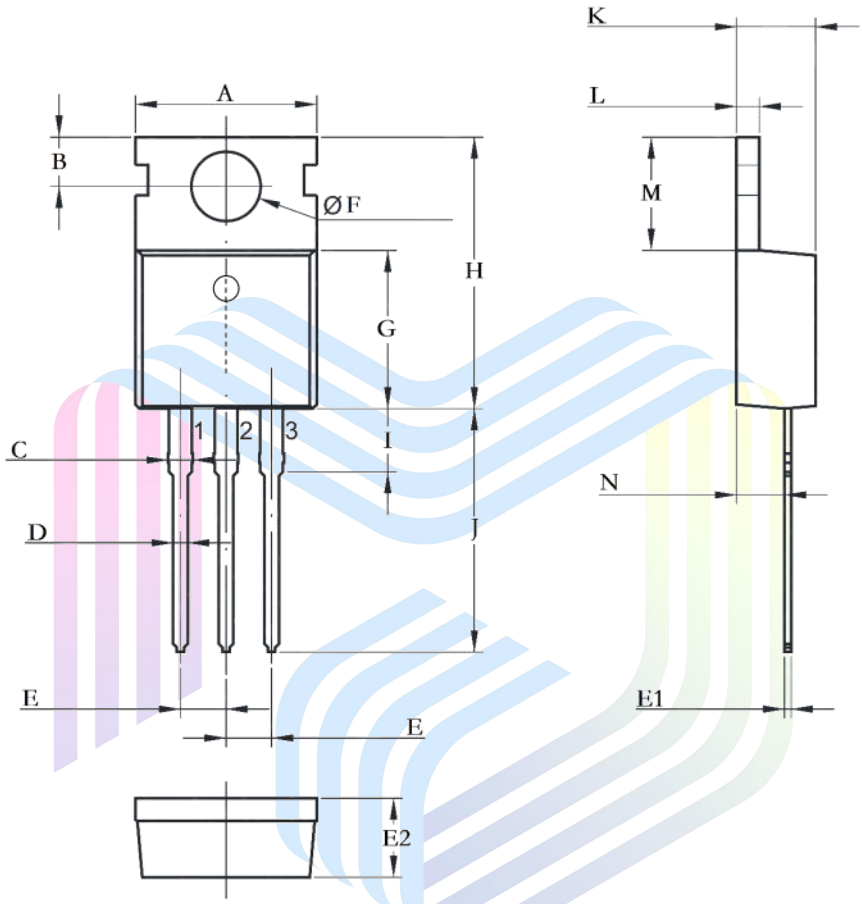


Figure 11: Normalized Maximum Transient Thermal Impedance



Mechanical Dimensions:

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	9.600	10.400	0.378	0.409
B	2.800TYP		0.110TYP	
C	1.200	1.600	0.047	0.063
D	0.600	1.000	0.024	0.039
E	2.540TYP		0.100TYP	
E1	0.300	0.700	0.012	0.028
E2	4.300	4.700	0.169	0.185
F	3.400	4.000	0.134	0.157
G	8.850	9.350	0.348	0.368
H	14.600	16.100	0.575	0.634
I	2.800	4.200	0.110	0.165
J	12.600	14.800	0.496	0.583
K	4.300	4.700	0.169	0.185
L	1.000	1.400	0.039	0.055
M	5.840	7.000	0.230	0.276
N	1.800	2.900	0.071	0.114

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Via-Media Semiconductor Limited Company

http://www.vmdsemi.com

Main Sites:

- **Headquarters**

Hangzhou Via-Media Semiconductor Co., LTD.
1305-1306, Building 71, No. 90, Wensan Road, Xihu District, Hangzhou, Zhejiang Province, P.R. China
Tel: +86-0571-8515 0563

- **Chengdu Office**

Chengdu Winhi Semiconductor Co., LTD.
Floor 15, Building 5, No. 171, Hele 2nd Street, Chengdu, Sichuan Province, P.R. China
Tel: +86-028-8505 0771

- **Shanghai**

Shanghai R&D Center.
1506~1508, Xinyin Building, 888 Yishan Road, Shanghai, P.R of China
Tel: +86- 021-54201999

- **Shenzhen**

Shenzhen Sales Center.
17B, No.1 Phoenix Building, 2008 Shennan Road, Shenzhen, P.R of China
Tel: +86-0755- 82570682

- **Xi'an**

Xi'an R&D Center
1703B, Building A, Greenland Center, Jinye Road, High-Tech Zone, Xi'an, Shaanxi, P.R of China